FIG.1

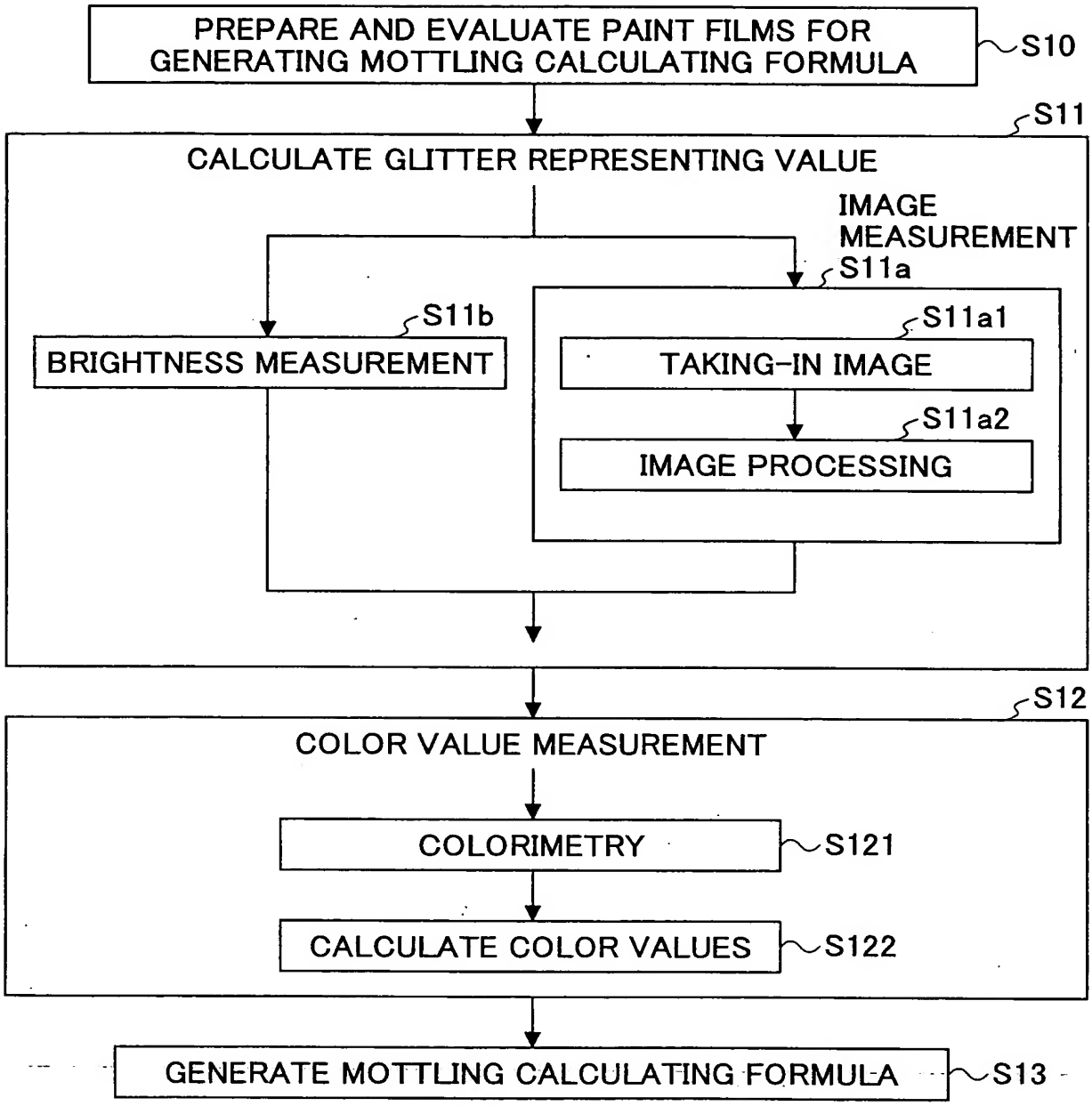

PREPARE AND EVALUATE PAINT FILMS FOR GENERATING MOTTLING CALCULATING FORMULA
S10
S11
CALCULATE GLITTER REPRESENTING VALUE
IMAGE MEASUREMENT
S11a
S11b
BRIGHTNESS MEASUREMENT
S11a1
TAKING-IN IMAGE
S11a2
IMAGE PROCESSING
S12
COLOR VALUE MEASUREMENT
COLORIMETRY
S121
CALCULATE COLOR VALUES
S122
GENERATE MOTTLING CALCULATING FORMULA
S13

FIG.2

CALCULATION OF HUE ANGLE

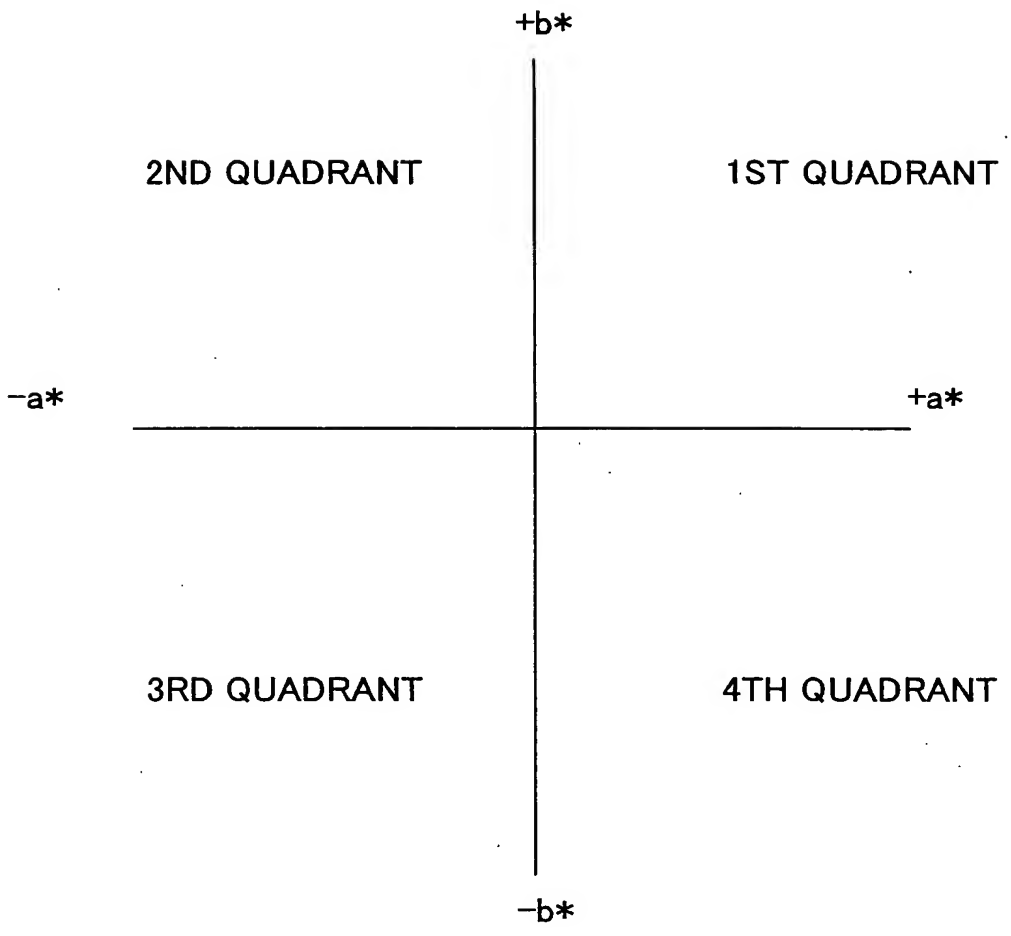


FIG.3

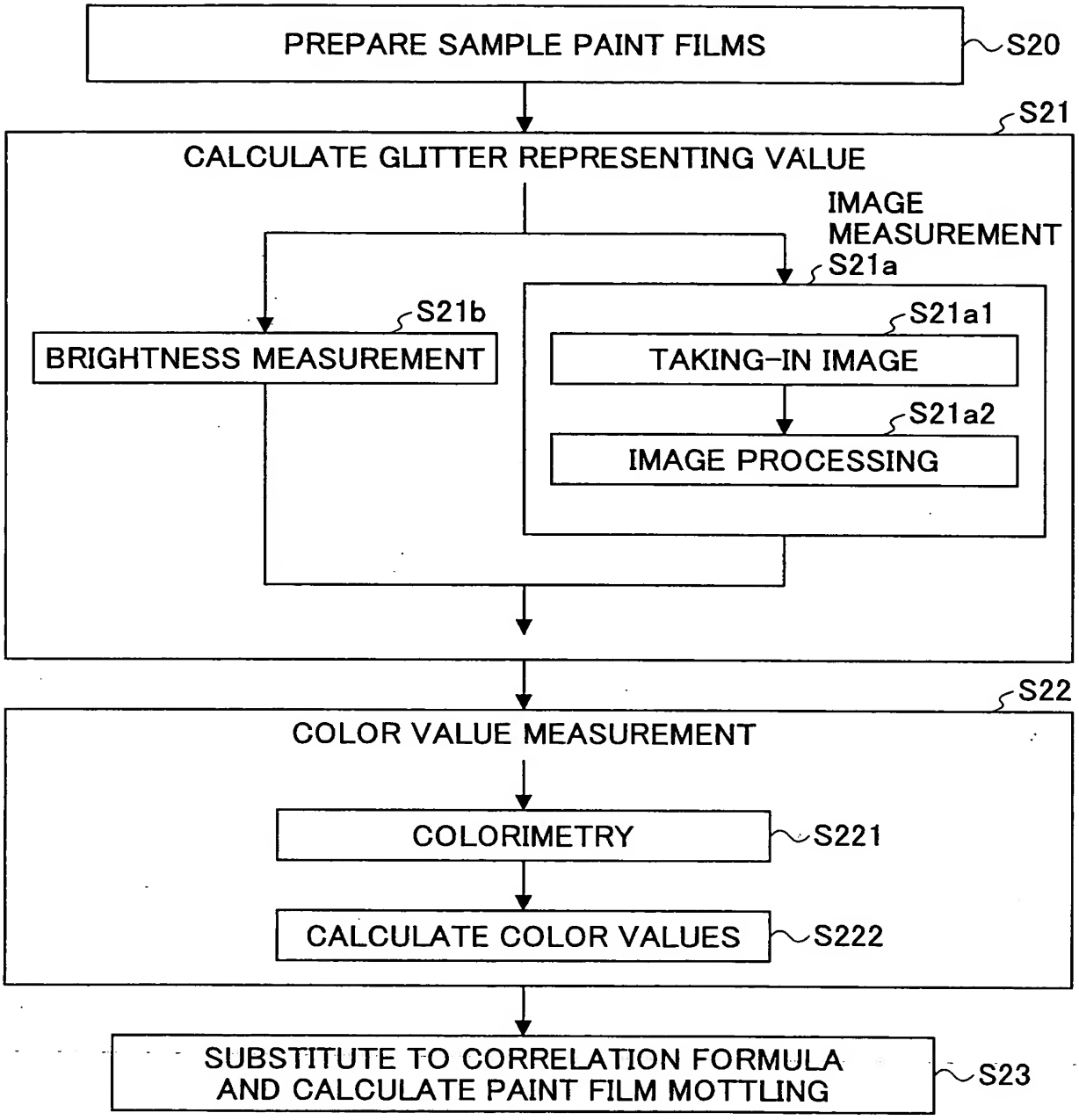

PREPARE SAMPLE PAINT FILMS
S20
S21
CALCULATE GLITTER REPRESENTING VALUE
IMAGE MEASUREMENT
S21a
S21b
BRIGHTNESS MEASUREMENT
S21a1
TAKING-IN IMAGE
S21a2
IMAGE PROCESSING
S22
COLOR VALUE MEASUREMENT
COLORIMETRY
S221
CALCULATE COLOR VALUES
S222
SUBSTITUTE TO CORRELATION FORMULA AND CALCULATE PAINT FILM MOTTLING
S23

FIG.4

	AO20001	AO20002	AO20005	AO20007	AO20008	AO20009	AO20010
ALUMINUM FLAKE PIGMENT A			5.7				
ALUMINUM FLAKE PIGMENT B		3.2		17.0	17.0	14.3	14.3
ALUMINUM FLAKE PIGMENT C	5.5	7.7					
ALUMINUM FLAKE PIGMENT D			7.2				
ALUMINUM FLAKE PIGMENT E	5.5						
CARBON BLACK PIGMENT A	0.01	0.01		0.3	0.3	0.5	0.5
ORGANIC REDDISH PIGMENT A	0.02	0.02					
INORGANIC REDDISH PIGMENT A	0.3	0.3	1.4				
ORGANIC YELLOWISH PIGMENT A			0.05				
ORGANIC YELLOWISH PIGMENT B			0.6				
ORGANIC BLUISH PIGMENT A				0.3	0.3	3.0	3.0
TOTAL PWC	11.33	11.23	14.95	17.6	17.6	17.8	17.8

FIG.5

PAINT PROCESS: BASE COATING TWICE WITH 90 SECOND INTERVALA

PAINTING MACHINE	ABB 1N1072F
PAINT DISCHARGE RATE	220 cc/min
SHAPING AIR	520 Nm^3/min
ROTATION	25000 RPM
PAINTING MACHINE LINEAR SPEED	900 mm/min
DISTANCE TO PAINTING OBJECT	300 mm

FIG.6

MEASURED VALUE AND CALCULATED VALUE

	PAINTED BOARD ID	AO20023	AO20024	AO20025	AO20026	AO20027	AO20028	AO20029	AO20030	AO20031	AO20032	AO20033	AO20034	AO20035	AO20036	AO20037	AO20038
	GLITTER REPRESENTING VALUE	107	73	235	188	119	110	157	99	90	142	111	94	238	236	148	150
VISUAL MOTTLING	MOTTLING	2.75	3.25	2	2.5	3	3	2.75	3	3.25	2.75	3.5	3.25	2	2	2.75	3
X-Rite 68M2	15° L*	111.71	95.09	126.29	93.00	41.07	36.91	108.71	109.71	98.51	84.38	83.53	79.74	121.49	117.89	112.68	112.56
	15° a*	-4.71	-4.26	-8.25	-37.80	-27.88	-24.10	-5.56	-4.62	-4.71	-28.46	-24.63	-23.40	-8.16	-7.78	-5.49	-5.33
	15° b*	-2.33	-1.89	-2.98	-31.24	-20.42	-19.61	-2.25	-1.67	-1.89	-23.25	-21.42	-21.32	-3.29	-2.88	-2.48	-2.19
	25° L*	93.53	83.26	94.72	68.27	28.23	25.28	89.72	92.67	85.42	67.48	70.45	69.33	93.90	91.83	90.33	89.87
	25° a*	-4.60	-4.19	-6.92	-29.99	-20.87	-17.97	-5.37	-4.53	-4.52	-25.25	-23.05	-21.89	-7.06	-6.84	-5.29	-5.11
	25° b*	-1.57	-1.41	-2.64	-25.39	-16.43	-15.82	-1.93	-1.32	-1.75	-20.86	-20.25	-20.09	-2.58	-2.44	-1.77	-1.80
	45° L*	61.51	60.62	45.93	31.63	10.56	9.65	58.01	60.82	59.51	40.70	47.32	48.55	49.29	49.19	54.36	55.08
	45° a*	-3.45	-3.36	-3.72	-14.15	-7.96	-6.35	-3.81	-3.20	-3.50	-16.08	-17.14	-16.88	-4.04	-4.04	-3.47	-3.47
	45° b*	-1.94	-1.68	-2.93	-17.08	-10.89	-10.58	-2.04	-1.73	-1.90	-16.60	-17.44	-17.56	-2.79	-2.74	-1.80	-2.00
	75° L*	36.06	39.83	22.70	12.76	3.42	3.52	35.07	36.92	38.06	22.39	28.27	30.34	23.71	23.71	32.37	32.78
	75° a*	-3.08	-3.20	-3.06	-5.18	0.19	0.27	-3.38	-2.93	-3.24	-9.57	-11.62	-11.94	-3.37	-3.32	-3.14	-3.16
	75° b*	-2.14	-1.97	-3.13	-12.86	-4.91	-5.18	-2.43	-2.07	-2.10	-13.50	-14.87	-15.76	-3.26	-3.22	-2.38	-2.28
	110° L*	26.50	29.14	16.08	7.21	2.09	2.14	26.18	27.41	28.57	14.70	19.26	21.49	17.26	16.57	24.40	24.39
	110° a*	-3.45	-3.32	-3.50	-2.78	1.26	1.27	-3.68	-3.23	-3.46	-7.45	-9.30	-9.92	-3.89	-3.61	-3.46	-3.46
	110° b*	-2.39	-2.06	-3.12	-11.51	-2.94	-3.31	-2.29	-2.18	-2.09	-12.14	-13.78	-14.81	-3.42	-3.32	-2.31	-2.36
	15° C VALUE	5.25	4.66	8.77	49.04	34.56	31.07	6.00	4.91	5.08	36.75	32.64	31.66	8.80	8.30	6.02	5.76
	25° C VALUE	4.86	4.42	7.41	39.29	26.56	23.94	5.71	4.72	4.85	32.75	30.68	29.71	7.52	7.26	5.58	5.42
	45° C VALUE	3.958042	3.756594	4.735325	22.17992	13.48902	12.33932	4.32177	3.637705	3.982462	23.11117	24.45267	24.3575	4.909756	4.881516	3.909079	4.005109
	75° C VALUE	3.750467	3.757779	4.377271	13.86405	4.913675	5.187032	4.162848	3.58745	3.861036	16.54796	18.87171	19.77223	4.688763	4.625019	3.940051	3.896665
	110° C VALUE	4.196975	3.907173	4.688752	11.84097	3.198625	3.545279	4.33434	3.896832	4.042239	14.24367	16.62463	17.82533	5.179624	4.904539	4.160252	4.188222
	15° -100° C VALUE	1.06	0.75	4.08	37.20	31.36	27.52	1.66	1.02	1.03	22.51	16.02	13.83	3.62	3.39	1.86	1.57
	15° HUE ANGLE	206.32	203.93	199.86	219.57	216.22	219.14	202.03	199.87	201.86	21.925	221.01	222.34	201.96	200.31	204.31	202.34
	25° HUE ANGLE	198.84	198.60	200.88	220.25	218.21	221.36	199.77	196.25	201.16	219.56	221.30	222.54	200.07	199.63	198.50	199.40
	45° HUE ANGLE	209.35	206.57	218.23	230.36	233.84	239.03	208.17	208.40	208.50	225.91	225.50	226.13	214.63	214.15	207.42	209.96
	75° HUE ANGLE	94.62	93.87	101.01	150.72	156.94	157.55	95.30	94.32	94.20	132.56	127.67	126.25	100.70	101.00	95.57	95.34
	110° HUE ANGLE	214.71	211.82	221.71	256.42	293.20	290.99	211.89	214.02	211.13	238.46	235.98	236.19	221.32	222.60	213.73	214.30
	15° -100° HUE ANGLE	-8.39	-7.89	-21.85	-36.85	-76.98	-71.86	-9.86	-14.14	-9.27	-19.22	-14.97	-13.85	-19.36	-22.29	-9.42	-11.96
	15° -100° L* VALUE	85.21	65.95	110.21	85.79	38.98	34.77	82.53	82.3	69.94	69.68	64.27	58.25	104.23	101.32	88.28	88.17

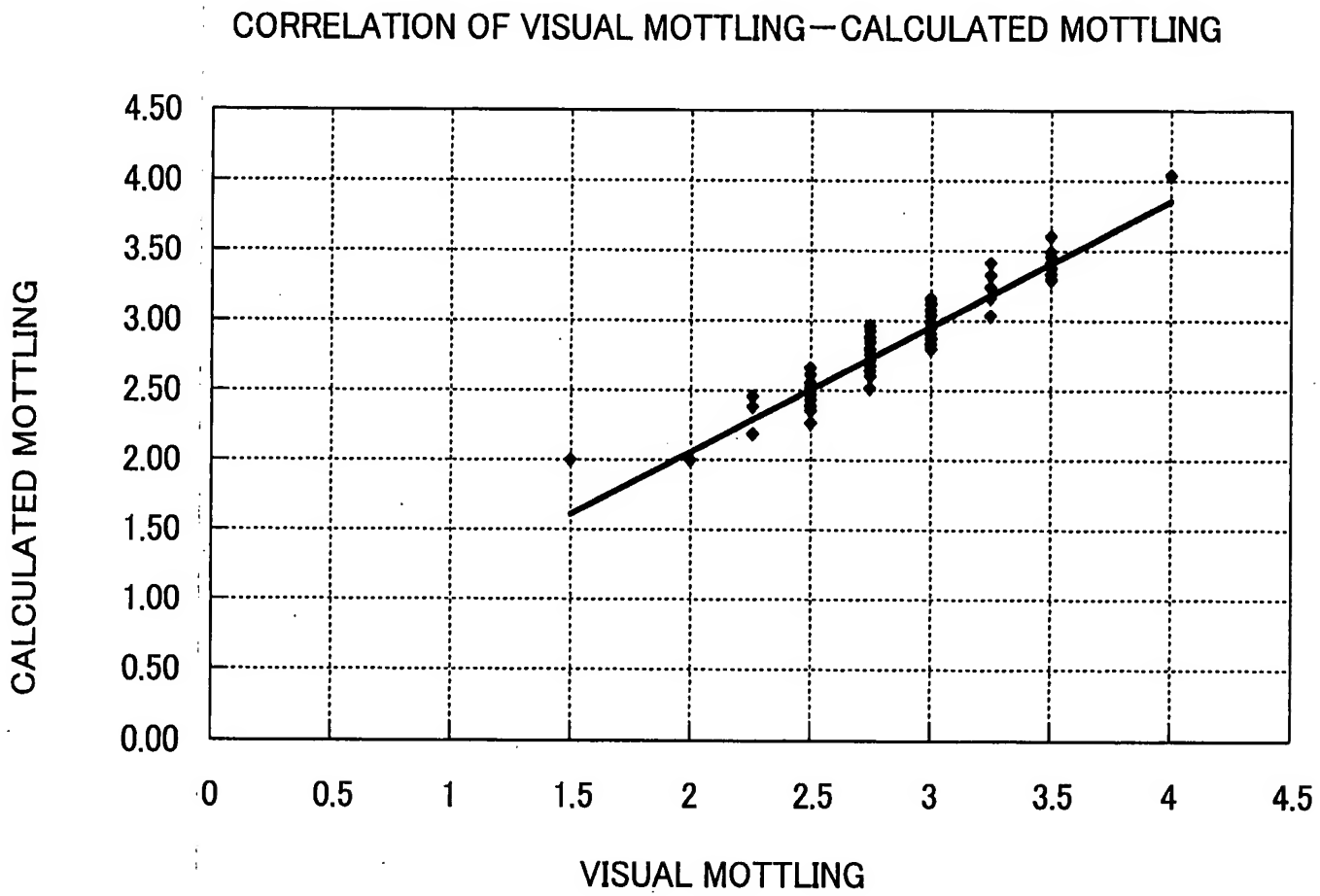
FIG.7

QSAR ANALYSIS

	r^2 (CONTRIBUTION RATIO)	r (CORRELATION COEFFICIENT)	CORRELATION FORMULA
1	0.774	0.885	3.35962+0.000474*X1^2+0.11361*<2.25-X1>^2+0.057642*<"X2"-97>-0.064096*<"X2"-90>-0.006376*<103.37-X3>+0.000767*<52.36-X4>^2
2	0.774	0.885	3.36022+0.000476*X1^2+0.000727*<53.49-X4>^2+0.113511*<2.25-X1>^2+0.057554*<"X2"-97>-0.064014*<"X2"-90>-0.006606*<103.37-X3>
3	0.774	0.885	3.2996+0.013184*X1-0.007534*<95.09-X3>+0.000785*<52.36-X4>^2+0.130979*<2.25-X1>^2-0.065116*<"X2"-90>+0.058619*<"X2"-97>
4	0.773	0.885	3.34463-0.00732*<95.09-X3>+0.0008*<52.36-X4>^2+0.08307*<2.54-X1>^2+0.000443*X1^2+0.077622*<"X2"-95>-0.08417*<"X2"-90>
5	0.773	0.885	3.30917+0.08094*<"X2"-95>+0.012971*X1-0.007545*<95.09-X3>+0.000773*<52.36-X4>^2+0.128525*<2.25-X1>^2-0.087593*<"X2"-90>
6	0.770	0.883	3.34619-0.007719*<95.09-X3>+0.041874*<"X2"-97>-0.048411*<"X2"-88>+0.000448*X1^2+0.08304*<2.54-X1>^2+0.000771*<53.49-X4>^2
7	0.770	0.883	3.38101+0.000461*X1^2-0.053049*<"X2"-88>-0.008198*<95.47-X3>+0.000655*<59.63-X3>^2+0.139831*<2.05-X1>^2+0.04662*<"X2"-97>
8	0.770	0.883	3.35299+0.000801*<52.36-X4>^2-0.007387*<95.09-X3>+0.042493*<"X2"-97>-0.049023*<"X2"-88>+0.000439*X1^2+0.111768*<2.25-X1>^2
9	0.770	0.883	3.35271+0.000705*<55.45-X4>^2-0.008205*<95.09-X3>+0.042084*<"X2"-97>-0.048633*<"X2"-88>+0.000441*X1^2+0.111394*<2.25-X1>^2
10	0.774	0.885	3.34303+0.000757*<53.49-X4>^2+0.117817*<2.25-X1>^2+0.058131*<"X2"-97>-0.064606*<"X2"-90>-0.007873*<95.09-X3>+0.013639*<"X1"-3.99>

45° CHROMA SATURATION	X1
GLITTER REPRESENTING VALUE	X2
15° L*	X3
BRIGHTNESS FF	X4
HUE ANGLE FF	X5
CHROMA SATURATION FF	X6
45° HUE ANGLE	X7
VISUAL MOTTLING VALUE	y

FIG.8


CORRELATION OF VISUAL MOTTLING—CALCULATED MOTTLING
CALCULATED MOTTLING
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
VISUAL MOTTLING